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Wolfgang Stephan

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FISH & RICHARDSON, P.C.

PO BOX 1022

MINNEAPOLIS, MN 55440-1022

EXAMINER

COLAN, GIOVANNA B

ART UNIT

PAPER NUMBER

2162

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/601,258

Applicant(s)

STEPHAN, WOLFGANG

Examiner

Giovanna Colan

Art Unit

2162

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-60 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03/29/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the Amendment filed on April 5, 2006.
2. Claims 1 – 3, 5, 15 – 17, 19, 25 – 27, 29, 37 – 39, 41, 51 – 53, and 55 were amended. No claims were canceled. No claims were added.
3. This action is made Final.
4. Claims 1 – 60 are pending in this application.
5. Applicant's arguments filed on April 5, 2006 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 3, 5, 8, 12, 17, 19, 27, 29, 31, 39, 41, 44, 48, 53, and 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claims 8, 31, and 44 recite the limitation " x is in the range of 256 to 512 and y is in the range of 128 to 256 " in lines 1 – 2. The lowest range value of x "256" is the same as the highest range value of y "256", and therefore the ranges are overlapping each other. It is unclear whether this is a single range which covers both values of x and y or

not. This renders the claims indefinite. Furthermore, the limitation of claims 1, 15, 25, 37, and 51 discloses that, "y is not equal to x". Examiner is unclear how x and y can both cover and overlapping range value and have the same number, such as 256, and still not be equal. This results in a contracting limitation, and therefore invalid. This renders the claims indefinite.

Claims 12, and 48 recite the limitation "approximately 80 to 90 %" in line 1. It is unclear whether the claim refers an amount within this range or outside. In other words, it is unclear whether this range includes numbers lower than 80 or larger than 80. This renders the claim 12 and 48 indefinite.

Claims 3, 5, 17, 19, 27, 29, 39, 41, 53, and 55 recite the limitation "immediately precede the skip entry". It is unclear how near the skip entry is preceded, for example, after 1, 2, ... etc, seconds. Therefore, this renders the claim 12 and 48 indefinite.

Appropriate action is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claim 1 – 7, 9 – 14, 16 – 30, 32 – 43, and 45 – 50, 52 – 60 are rejected under 35 U.S.C. 102(e) as being anticipated by Broder et al. (Broder hereinafter) (US Patent Application Pub No. 2004/0243560 A1, filed: May 30, 2003).

Regarding Claim 1 and 37, Broder discloses an article comprising a machine-readable medium storing instructions operable to cause one or more machines to perform operations comprising:

determining a value x such that at least a majority of the index terms occur in x documents or fewer (Page 17 and 18, [0307] and [0314], lines 1 – 3 and 3 – 9; respectively, Broder¹), where x is an integer (Page 10, [0182], lines 6 – 8, Broder);

determining a value y , where y is not equal to x (Page 15, [0277], lines 1 – 2, k be the smallest index, Broder), where y is an integer (Page 10, [0182], lines 6 – 8, Broder);

generating an inverted index for the collection of documents (Page 9, [0162], lines 1 – 3, Broder), the inverted index including an inverted list for each of the index terms (Page 14, [0244], lines 2 – 3, Broder), each inverted list including at least one posting (Page 14, [0244], lines 2 – 5, Broder) and, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10, Broder²), further including a skip entry after the x th

¹ Wherein the top “ n ” documents corresponds to the documents with the majority of index terms claimed; specifically “ n ” corresponds to the value x claimed. The scoring procedure utilized by Broder (as disclosed in detailed in Page 16, [0286], lines 5 – 6, Broder) including terms associations with upper bounds on its maximal contribution to documents scores; wherein the maximal contributing of index terms corresponds to the majority of the index terms as claimed.

² Broder discloses that the method `next(id)` (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which $DID \geq id$ (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing $DIDs$. This implies that, if

posting (Page 14, [0245], lines 10 – 12, Broder) and one or more skip entries thereafter at intervals of every y th posting (Page 15, [0277], lines 1 – 6, Broder³);

wherein:

a posting includes a document identifier identifying a document in the collection of documents (Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder);

a skip entry includes a document identifier that is included in a boundary posting of a block of postings immediately adjacent to the skip entry in the inverted list (Page 15, [0277], lines 1 – 6, Border⁴), where a block of postings includes postings having document identifiers ranging from a lower to an upper value and where a boundary posting is a posting having a document identifier of either the lower or the upper value (Page 16 and 18, [0286] and [0314], lines 5 – 9 and 3 – 9; respectively, Broder).

Regarding Claims 2, and 38, Broder discloses a method, wherein each posting further includes a position identifier identifying a position of the index term in the document (Page 14, [0244], lines 8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of occurrences of the terms/ frequency; respectively, Broder).

there is $DID < id$ (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

³ The cursor is advanced to the position of k value. There is a skip entry at the k th value.

Regarding Claims 3, and 39, Broder discloses a method, wherein the boundary posting includes a document identifier having the lower value in the range of values and the block of postings immediately follow the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17, [0301], lines 10 – 18, Broder⁵).

Regarding Claims 4, and 40, Broder discloses a method, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder⁶).

Regarding Claims 5, and 41, Broder discloses a method, wherein the boundary posting includes a document identifier having the higher value in the range of values and the block of postings immediately precede the skip entry in the inverted list (Page 17, [0302], lines 22 – 26, Broder⁷).

⁴ Wherein doc_i corresponds to the document identifier claimed. In addition, the step of advancing the cursor to next doc_l k corresponds to the step of

⁵ According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines 17 – 18). In addition, Broder discloses that this pivot term goes through an “if” statement which finds a first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the “next” method will return the smallest possible document number following the last one. In addition, the smallest document number corresponds to the lower value claimed.

⁶ Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

⁷ The next() function iterates through the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location. Wherein the location greater (largest document number of documents) than the pivot location corresponds to the higher value as claimed.

Regarding Claims 6, and 42, Broder discloses a method, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder⁸).

Regarding Claims 7, and 43, Broder discloses a method including all the limitations of claim 1, and 37, as disclosed above, wherein y is less than x (Page 15, [0277], lines 1 – 2, k be the smallest index, Broder).

Regarding Claims 9, and 45, Broder discloses a method, wherein the collection of one or more documents includes one or more binary files, data tables, source code files, text documents or combinations thereof (Page 9, [0158], lines 1 – 13, Broder).

Regarding Claims 10, and 46, Broder discloses a method including all the limitations of claim 1, and 37, as disclosed above, further comprising:

compressing the inverted index (Page 15, [0273], lines 1 – 3, zipping, Broder).

Regarding Claims 11, and 47, Broder discloses a method, wherein substantially all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16, Broder).

⁸ Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Regarding Claims 12, and 48, Broder discloses a method, wherein approximately 80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 – 3, top n results, Broder).

Regarding Claims 13, and 49, Broder discloses a method, wherein for each inverted list, if the number of postings exceeds x, further including a skip entry before the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted, Broder).

Regarding Claims 14, and 50, Broder discloses a method, wherein for each inverted list, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10, Broder⁹), further including a skip entry after the last posting in the inverted list (Page 14, [0245], lines 10 – 12, Broder).

Regarding Claims 16, and 52, Broder discloses a method, wherein each posting further includes a position identifier identifying a position of the index term in the document (Page 14, [0244], lines 8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of occurrences of the terms/ frequency; respectively, Broder).

⁹Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which DID \geq id (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This implies that, if

Regarding Claims 17, and 53, Broder discloses a method, wherein wherein the boundary posting includes a document identifier having the lower value in the range of values and the block of postings immediately follow the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17, [0301], lines 10 – 18, Broder¹⁰).

Regarding Claims 18, and 54, Broder discloses a method, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder¹¹).

Regarding Claims 19, and 55, Broder discloses a method, wherein the boundary posting includes a document identifier having the higher value in the range of values and the block of postings immediately precede the skip entry in the inverted list (Page 17, [0302], lines 22 – 26, Broder¹²).

there is $DID < id$ (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

¹⁰ According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines 17 – 18). In addition, Broder discloses that this pivot term goes through an "if" statement which finds a first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the "next" method will return the smallest possible document number following the last one. In addition, the smallest document number corresponds to the lower value claimed.

¹¹ Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

¹² The next() function iterates through the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location. Wherein the location greater (largest document number of documents) than the pivot location corresponds to the higher value as claimed.

Regarding Claims 20, and 56, Broder discloses a method, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder¹³).

Regarding Claims 21, and 57, Broder discloses a method, wherein substantially all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16, Broder).

Regarding Claims 22, and 58, Broder discloses a method, wherein approximately 80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 – 3, top n results, Broder).

Regarding Claims 23, and 59, Broder discloses a method, wherein for each inverted list, if the number of postings exceeds x, further including a skip entry before the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted, Broder).

Regarding Claims 24, and 60, Broder discloses a method, wherein for each inverted list, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10,

¹³ Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Broder¹⁴), further including a skip entry after the last posting in the inverted list (Page 14, [0245], lines 10 – 12, Broder).

Regarding Claim 25, Broder discloses an inverted index for a collection of documents (Page 9, [0162], lines 1 – 3, Broder), each document comprising one or more index terms (Page 14, [0244], lines 3 – 5, Broder), the inverted index comprising:

an inverted list for each index term in the collection of documents (Page 14, [0244], lines 2 – 3, Broder); and

one or more inverted lists including a quantity of postings (Page 14, [0244], lines 2 – 5, Broder) that exceeds a value x (Page 14, [0245], lines 7 – 10, Broder), a skip entry after the x th posting (Page 14, [0245], lines 10 – 12, Broder), and one or more additional skip entries thereafter at intervals of every y th posting (Page 15, [0277], lines 1 – 6, Broder¹⁵), where the value x is such that at least a majority of the index terms occur in x documents or fewer (Page 17 and 18, [0307] and [0314], lines 1 – 3 and 3 – 9; respectively, Broder¹⁶) and the value y is not equal to the value x (Page 15, [0277], lines 1 – 2, Broder¹⁷) and x and y are integers;

¹⁴Broder discloses that the method `next(id)` (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which $DID \geq id$ (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing $DIDs$. This implies that, if there is $DID < id$ (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

¹⁵ The cursor is advanced to the position of k value. There is a skip entry at the k th value.

¹⁶ Wherein the top " n " documents corresponds to the documents with the majority of index terms claimed; specifically " n " corresponds to the value x claimed. The scoring procedure utilized by Broder (as disclosed in detailed in Page 16, [0286], lines 5 – 6, Broder) including terms associations with upper bounds on its maximal contribution to documents scores; wherein the maximal contributing of index terms corresponds to the majority of the index terms as claimed.

¹⁷ Y would be the smallest index k . And x would be the top n documents (the size of the heap) (Page 15, [0257], lines 15 – 16).

wherein:

a posting includes a document identifier identifying a document in the collection of documents (Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder);

a skip entry includes a document identifier that is included in a boundary posting of a block of postings immediately adjacent to the skip entry in the inverted list (Page 15, [0277], lines 1 – 6, Border¹⁸), where a block of postings includes postings having document identifiers ranging from a lower to an upper value and where a boundary posting is a posting having a document identifier of either the lower or the upper value (Page 16 and 18, [0286] and [0314], lines 5 – 9 and 3 – 9; respectively, Broder).

Regarding Claim 26, Broder discloses an inverted index, wherein each posting further includes position identifier identifying a position of the index term in the document (Page 14, [0244], lines 8 – 9, offsets of occurrences, Broder), and a frequency of the index term occurring in the document (Page 14 and 18, [0244] and [0316], lines 7 – 8 and 9 – 11, number of occurrences of the terms/ frequency; respectively, Broder).

Regarding Claim 27, Broder discloses an inverted index, wherein the boundary posting includes a document identifier having the lower value in the range of values and

the block of postings immediately follow the skip entry in the inverted list (Fig. 27, item 5, Page 16 and 17, [0301], lines 10 – 18, Broder¹⁹).

Regarding Claim 28, Broder discloses an inverted index, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder²⁰).

Regarding Claim 29, Broder discloses an inverted index, wherein the boundary posting includes a document identifier having the higher value in the range of values and the block of postings immediately precede the skip entry in the inverted list (Page 17, [0302], lines 22 – 26, Broder²¹)

Regarding Claim 30, Broder discloses an inverted index, as disclosed above, wherein the skip entry further includes information to locate the next skip entry in the inverted list (Fig. 27, items 13 and 22, Broder²²).

¹⁸ Wherein doc_i corresponds to the document identifier claimed. In addition, the step of advancing the cursor to next doc_i k corresponds to the step of

¹⁹ According to Broder, the pivot DID is the smallest DID that might be a candidate (Page 17, [0301], lines 17 – 18). In addition, Broder discloses that this pivot term goes through an “if” statement which finds a first pivot term with UB (upper bound) greater than the threshold (Fig. 27, item 5). This implies that the “next” method will return the smallest possible document number following the last one. In addition, the smallest document number corresponds to the lower value claimed.

²⁰ Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

²¹ The next() function iterates through the list and selects from the preceding terms the term with the location greater (largest document number of documents) than the pivot location. Wherein the location greater (largest document number of documents) than the pivot location corresponds to the higher value as claimed.

²² Posting[aterm] (located in the function next()) represents the information to locate next skip entry.

Regarding Claim 32, Broder discloses an inverted index, wherein substantially all of the index terms occur in x documents or fewer (Page 15, [0257], lines 14 – 16, Broder).

Regarding Claim 33, Broder discloses an inverted index, wherein approximately 80 to 90% of the index terms occur in x documents or fewer (Page 17, [0307], lines 1 – 3, top n results, Broder).

Regarding Claim 34, Broder discloses an inverted index, wherein the collection of one or more documents includes one or more binary files, data tables, source code files, text documents or combinations thereof (Page 9, [0158], lines 1 – 13, Broder).

Regarding Claim 35, Broder discloses an inverted index, wherein the one or more inverted lists further include a skip entry before the first posting in the inverted list (Page 15, [0257], lines 12 – 20, the result is inserted, Broder).

Regarding Claim 36, Broder discloses an inverted index, wherein the one or more inverted lists further include a skip entry after the last posting in the inverted list (Page 14, [0245], lines 10 – 12, Broder).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 8, 15, 31, 44, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Broder et al. (Broder hereinafter) (US Patent Application Pub No. 2004/0243560 A1, filed: May 30, 2003) in view of Young et al. (Young hereinafter) (US Patent No. 5,838,950, issued: November 17, 1998).

Regarding Claim 8, and 44, Broder discloses all the limitations as disclosed above. However, Broder is silent with respect to a range of 256 to 512 and a range of 128 to 256. On the other hand, Young discloses a system including bits and bytes including ranges of 256 to 512, and of 128 to 256 (Col. 140, lines 30 – 43, Young). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the Young's teachings to the system of Broder. Skilled artisan would have been motivated to do so, as suggested by Young (Col. 4, lines 1 – 5, Young), to provide a higher speed system. In addition, both of the references (Broder and Young) teach features that are directed to analogous art and they are directed to the same field of endeavor of database management system, such as, data

manipulation and indexing. This relation between both of the references highly suggests an expectation of success.

Regarding Claim 15, and 51, the Broder in view of Young combination ("Broder/Young" hereinafter) discloses an article comprising a machine-readable medium storing instructions operable to cause one or more machines to perform operations comprising:

receiving a collection of documents, each document comprising one or more index terms (Page 14, [0244], lines 3 – 5, Broder);

determining a value x , wherein at least a majority of the index terms occur in x documents or fewer (Page 17 and 18, [0307] and [0314], lines 1 – 3 and 3 – 9; respectively, Broder²³) and x is an integer (Page 10, [0182], lines 6 – 8, Broder) in the range of 256 to 512 (Col. 140, lines 30 – 43, Young);

determining a value y , wherein y is not equal to the value of x (Page 15, [0277], lines 1 – 2, k be the smallest index, Broder) and is an integer (Page 10, [0182], lines 6 – 8, Broder) in the range of 256 to 512 (Col. 140, lines 30 – 43, Young);

generating an inverted index for the collection of documents (Page 9, [0162], lines 1 – 3, Broder), the inverted index including an inverted list for each of the index terms (Page 14, [0244], lines 2 – 3, Broder), each inverted list including at least one posting (Page 14, [0244], lines 2 – 5, Broder) and, if the number of postings exceeds x

²³ Wherein the top " n " documents corresponds to the documents with the majority of index terms claimed; specifically " n " corresponds to the value x claimed. The scoring procedure utilized by Broder (as disclosed in detailed in Page 16, [0286], lines 5 – 6, Broder) including terms associations with upper bounds on its

(Page 14, [0245], lines 7 – 10, Broder²⁴), further including a skip entry after the xth posting (Page 14, [0245], lines 10 – 12, Broder) and one or more skip entries thereafter at intervals of every yth posting (Page 15, [0277], lines 1 – 6, Broder²⁵).

wherein:

a posting includes a document identifier identifying a document in the collection of documents (Page 14, [0244], lines 1 – 6, document unique identifier DID, Broder);

a skip entry includes a document identifier that is included in a boundary posting of a block of postings immediately adjacent to the skip entry in the inverted list (Page 15, [0277], lines 1 – 6, Border²⁶), where a block of postings includes postings having document identifiers ranging from a lower to an upper value and where a boundary posting is a posting having a document identifier of either the lower or the upper value (Page 16 and 18, [0286] and [0314], lines 5 – 9 and 3 – 9; respectively, Broder).

Additional limitations of claims 15 and 51, not included above, have been rejected under the same criteria as claims 8, 31, and 44 (See claims 8, 31, and 44 - *Claim Rejections - 35 USC § 112*- listed on this office action).

maximal contribution to documents scores; wherein the maximal contributing of index terms corresponds to the majority of the index terms as claimed.

²⁴Broder discloses that the method next(id) (page 14, [0245], lines 8 – 10). This method states that if there is **not** such document which $DID \geq id$ (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing DIDs. This implies that, if there is $DID < id$ (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

²⁵ The cursor is advanced to the position of k value. There is a skip entry at the kth value.

Regarding Claim 31, Broder/Young discloses an inverted index of claim 25, wherein x is in the range of 256 to 512 and y is in the range of 128 to 256 (Col. 140, lines 30 – 43, Young).

²⁶ Wherein doc_i corresponds to the document identifier claimed. In addition, the step of advancing the cursor to next doc_j corresponds to the step of

Response to Arguments

1. Applicant argues that the range values given in claims 8, 31, and 44 are clear, and there is no indefiniteness.

Examiner respectfully disagrees (See 112 rejection discussed above).

2. Applicant argues that the prior art fails to disclose; "determining a value x such that at least a majority of the index terms occur in x documents or fewer".

Examiner respectfully disagrees. Broder does disclose determining a value x such that at least a majority of the index terms occur in x documents or fewer (Page 17 and 18, [0307] and [0314], lines 1 – 3 and 3 – 9; respectively, Broder). Wherein the top "n" documents corresponds to the documents with the majority of index terms claimed; specifically "n" corresponds to the value x claimed. The scoring procedure utilized by Broder (as disclosed in detailed in Page 16, [0286], lines 5 – 6, Broder) including terms associations with upper bounds on its maximal contribution to documents scores; wherein the maximal contributing of index terms corresponds to the majority of the index terms as claimed. Broder's procedure further specifies that these terms are index terms (Page 16, [0289], lines 1 – 3, Broder). In addition, in the case of Broder's disclosure, the step of finding the top "n" documents and/or results for a given query, which includes terms, implies the utilization of a step which finds this value of "n" documents such that the majority of these terms occur in this "n" values.

3. Applicant argues that the prior art fails to disclose; “generating an inverted index for the collection of documents, the inverted index including an inverted list for each of the index terms, each inverted list including at least one posting and, if the number of postings exceeds x, further including a skip entry after the xth posting and one or more skip entries thereafter at intervals of every yth posting”.

Examiner respectfully disagrees. Broder does disclose generating an inverted index for the collection of documents (Page 9, [0162], lines 1 – 3, Broder), the inverted index including an inverted list for each of the index terms (Page 14, [0244], lines 2 – 3, Broder), each inverted list including at least one posting (Page 14, [0244], lines 2 – 5, Broder) and, if the number of postings exceeds x (Page 14, [0245], lines 7 – 10, Broder), further including a skip entry after the xth posting (Page 14, [0245], lines 10 – 12, Broder) and one or more skip entries thereafter at intervals of every yth posting (Page 15, [0277], lines 1 – 6, Broder). Wherein the next (id) method (Page 14, [0245], lines 8 – 10) corresponds to the step including if the number of postings exceeds x claimed. This method, next (id), states that if there is **not** such document which $DID \geq id$ (where DID = number of documents, and id = number of posting), then the term iterator returns a special posting that is larger than all the existing $DIDs$. This implies that, if there is $DID < id$ (the number of postings exceeds the number of documents entered), then the iterator returns the special posting mentioned above.

4. Applicant argues that the prior art fails to disclose; "including such skip entries in an inverted list for an index term".

Examiner respectfully disagrees. Broder does disclose a step including such skip entries in an inverted list for an index term (Page 14, [0245], lines 6 – 9, Broder). Wherein the given entry corresponds to the skip entry claimed; and the list associated to the inverted index (Page 14, [0244] and [0245], lines 1 – 5 and 1 – 6; respectively, Broder) corresponds to the inverted index list claimed. Furthermore, examiner interprets the given entry for skipping as the "skip entry" claimed, because they both have the same function such as skipping.

5. Applicant argues that the prior art fails to disclose; "a skip entry per se".

Examiner respectfully disagrees. Broder does disclose a skip entry per se (Page 14, [0245], lines 6 – 12, Broder). Wherein the "entry" utilized in the step for skipping to a given entry corresponds to the "skip entry" claimed. Therefore, these entries, the entry for skipping from Broder and the skip entry claimed, have the same function such as skipping. Broder further discloses a step that advances a cursor to the position of k value (Page 15, [0277], lines 1 – 6, Broder). Wherein the step of advancing the cursor to a position implies skipping entries as claimed. By advancing the cursor, this feature performs this step without the need of going through every single entry and therefore skipping entries. Furthermore, Border discloses the utilization of stop-words, which also contribute to the step of using skip entries as claimed (Page 18, [0322], lines 7 – 8, Broder).

Conclusion

1. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Prior art Made of Record

1. Broder et al. (US Patent Application Pub. No. 2004/0243560 A1) discloses a system, method and computer program product for performing unstructured information management and automatic text analysis, including an annotation inverted file system facilitating indexing and searching.
2. Antoshenkov (US Patent No. 6,439,783 B1) discloses a range-based query optimizer.
3. Huynh et al. (US Patent No. 5,539,899) discloses a system and method for handling a segmented program in a memory for a multitasking data processing system utilizing paged virtual storage.
4. Young et al. (US Patent No. 5,838,950) discloses a method of operation of a host adapter integrated circuit.


Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Giovanna Colan whose telephone number is (571) 272-2752. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Giovanna Colan
Examiner
Art Unit 2162
May 18, 2006


JOHN BREENE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

SA